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Patterson returns to lead Engineering

By Lynda Seaver

NEWSLINE STAFF WRITER

It took little to convince Steven Patterson to return to the Lab, where he now serves as associate director for Engineering.

Patterson, a former Lab researcher who left to become a distinguished professor of precision engineering at the University of North Carolina at Charlotte, saw the offer as an “interesting building opportunity,” appropriate for someone dedicated to engineering.

In addition to building on science and technology, Patterson is excited to shape his new organization to meet the Lab’s future needs. “The Lab is bringing up a whole new generation of engineers and scientists,” he explained. “To be able to shape what the Lab is going to look like, well, that’s a worthy thing.”

Patterson, 54, officially began his new assignment Monday, following introductions by Director Michael Anastasio to Lab management and Engineering employees. He replaces Glenn Mara, who was named deputy director of Operations last year. (Jeff Williams and Jens Mahler held the role in an acting capacity.)

Patterson returns to the Lab after a 10-year



JACQUELINE MCBRIDE/NEWSLINE

Engineering Associate Director Steve Patterson settled into his new office earlier this week. He returned to the Lab after 10 years of teaching at the University of North Carolina, Charlotte.

absence. In 1993 he left for the University of North Carolina at Charlotte, where he helped start the doctoral program in engineering, and served as the United Dominion Industries Distinguished Professor of Precision Engineering.

During his first tenure at the Lab he held a number of positions, including section leader for fabrication technology, associate program leader for research/precision engineering and division leader/materials fabrication division. He also

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Landmark experiment maps uncharted properties and physics of plutonium

By Anne M. Stark

NEWSLINE STAFF WRITER

Making a landmark event in the history of the experimental investigation of plutonium, Lab scientists for the first time have fully mapped the phonons in gallium-stabilized delta plutonium.

The experiment promises to reveal much about the physics and material properties of plutonium and its alloys.

The research, conducted in collaboration with researchers at the European Synchrotron Radiation Facility in Grenoble, France, and the University of Illinois at Champaign- Urbana-, and led by Livermore physical chemist Joe Wong, will be published in the Aug. 22 edition of *Science*.

Other Livermore researchers include Daniel Farber, Florent Occelli, Adam Schwartz, Mark Wall and Carl Boro.

Wong’s team took the first measurements of the complete phonon dispersions in a delta plutonium-gallium alloy, using a unique high-resolution inelastic X-ray scattering technique developed at the European Synchrotron Radiation Facility.

Since its discovery in 1941, many technical and safety issues have made experimental observations of plutonium extremely difficult. Measuring the phonon dispersion curves is key to understanding the properties of plutonium materials, such as force constants, sound velocities, elasticity, phase stability and thermodynamics.

But for years, scientists have been plagued trying to measure these phonon dispersion curves in plutonium because they were unable to grow the

See PLUTONIUM, page 8

New publication celebrates Lab bioscience discoveries

By Charles Osolin

NEWSLINE STAFF WRITER

It’s often called one of Lawrence Livermore’s “best-kept secrets.” The Lab has a rich legacy of biological, medical, and environmental research, from its pioneering studies of the long-term genetic effects of atomic weapons, to its key role in the landmark Human Genome Project and its development of innovative technologies to defend against bioterrorism.

Those “secrets” are now on public display, thanks to a colorful 60-page document titled “40 Years of Discovery” that traces the history of the Lab’s bioscience research in the words of the people who lived it.

Published in conjunction with the 40th anniversary of bioscience research at LLNL, the document is a kind of “written oral history” of the seminal research projects that have kept the Lab at

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Children’s Center granted national accreditation

By Linda Lucchetti

NEWSLINE STAFF WRITER

The Lawrence Livermore Employee Service’s Association Children’s Center has something to brag about. It recently received an “A”–“A” as in “Accreditation,” that is.

The National Association for the Education of Young Children (NAEYC), the nation’s largest organization of early childhood educators, has granted the Children’s Center accreditation, valid for three years. NAEYC administers the largest and most widely recognized accreditation system for all types of early childhood schools and child care centers.

“Receiving this honor from the NAEYC validates the Children’s Center’s efforts over the years to offer the highest quality program possible for children and families,” stated Laura Reno, Children’s Center Director for



JACQUELINE MCBRIDE/NEWSLINE

From left to right: Jan Tulk, holding Jeffrey Wisoff, teacher Michelle Silva with Siddharth Kumar and Robert Heeter and Children’s Center Director Laura Reno.

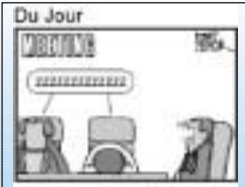
the past 17 years.

Reno said the time was right to undergo such a

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Operation
Welcome
Home
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Laboratory’s
cartoonist ‘Du
Jour’
— Page 3



Discovering
LLNL’s wild
side
— Page 8



LAB COMMUNITY NEWS

Weekly Calendar

Technical Meeting Calendar, page 4

Thursday
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The **San Joaquin Expanding Your Horizons** group is looking for volunteers for a brochure mailing party today. EYH is a conference that aims to expose 6–12 grade girls to math and science career opportunities. Help assemble information packets between 11:30 a.m. and 1 p.m. in the CRF mezzanine at Sandia. Refreshments will be served. For more information, contact Yuki Ohashi, 294-2393, or yohashi@sandia.gov.

Friday
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The Benefits Office will continue the **brown-bag series** on how to enhance your financial security by participating in the Tax-Deferred 403(b). The next session will be today from 12:15 – 1:15 p.m. in Bldg. 571, conference room 2301; additional sessions will be held on the last working day of each month (excluding November and December) throughout 2003. Bring your lunch and your questions. For additional information about benefit services or events, please see the Website at www.llnl.gov/llnl/02employment/benefits/benefits.htm.

...

Be sure to redeem your **25 percent discount coupon** (distributed by Lab mail 7/17) for dry cleaning and laundry service at the Time Zone by today. Items for cleaning or laundering can be dropped off at the Time Zone (Trailer 4128) Monday-Friday, 7:30 a.m. until 3 p.m. Items requiring special cleaning, such as leather garments, will take longer. Coupons exclude leather items and are good through today. They should be presented at the time items are dropped off. Limit one coupon per customer.



The **22nd annual Livermore Valley Wine Country Harvest Wine Celebration** will take place Labor Day weekend, Sunday, Aug. 31 and Monday, Sept. 1. "Vineyard Tour 2003," will offer two days of activities including bus service to 25 valley wineries, wine tasting, food and music. Tickets for the two-day event are \$35 in advance, \$40 the day of event and \$30 for a Monday-only pass. Tickets may be purchased by calling 925 447 WINE (9463) or on the Web at www.livermorewine.com.

...

The **East Bay Women's Network** will present Amilya Antonetti, founder of SOAPWORKS speaking on "One Mom Taking on the Big Boys – What It Takes to Survive and Win" from 11:30 a.m.-1:30 p.m. Sept. 3 at The Englander Restaurant, 101 Parrott Street, San Leandro.

...

The 14th annual **LLESA Vintage Vehicle Show** is Thursday, Sept. 18. Individuals interested in registering a vehicle for the show should do so by calling the LLESA Office, 2-9402. Show classifications include: Vintage (pre '55), Classic (pre '65), Factory Muscle, Street Rods, Sports Car, Motorcycles, Kit Cars, Under Construction and Other.

Welcome home operation



COURTESY OF CHELLE CLEMENTS

Members of the LLNL Armed Forces Veterans Association helped the Tri-Valley area celebrate the return of U.S. troops from Iraq and Afghanistan during Operation Welcome Home on Saturday, Aug. 16. Before the parade, Lab employees and family members posed in front of and in Johan Rock's 1943 International one-ton truck that saw Pacific service in WWII. In front, John Rock, Karen Ballou, Harold Swartz, Chelle Clements, Jim Hamilton and Mike Silva. Back row, Debbie Rock, Johan Rock, Stephanie Rock and Bonnie Hamilton. The celebration featured a parade in downtown Livermore and a picnic and honors ceremony at Livermore's Robertson Park. Operation Welcome Home souvenir T-shirts, caps and visors will be on sale at the on-site UNCLE Credit Union at reduced prices for the next two weeks.

IN MEMORIAM

David Rufus Brannum

David Rufus Brannum of Livermore died Aug. 14. He was 79.

Brannum was born Nov. 17, 1923, in Los Angeles. He served in the U.S. Navy, working with radar and radio transmission.

He worked for 35 years as an electrical engineer at the Laboratory until he retired in 1988.

Brannum was an avid fisherman, camper, and gardener, and was a member of the American Legion, the Institute of Electrical and Electronics Engineers, and was involved in the Apple Computer Users Club run through LLESA.

He is survived by his wife, Dorothy of Livermore; three children, James of San Jose, and Lynn and Genell of Livermore; and six grandchildren.

Memorial services will be held today at 2 p.m. at Callahan Mortuary in Livermore. A special internment will also be held at the Veteran's Cemetery in the Central Valley on Aug. 29 at 1 p.m.

Richard Hickman

Richard Hickman of Modesto died July 30. He was 69.

He was born July 18, 1934, in Milwaukee. He earned his bachelor's degree at Wabash College in Indiana, where he was elected to Phi Beta Kappa. He earned his master's degree from the University of Illinois and his PhD. from UC Davis.

Hickman moved to Livermore in 1964 and worked as a mathematician in the Computation Directorate at the Lab. He retired in 1990 and moved to Modesto where he taught math at Modesto Junior College.

Hickman enjoyed windsurfing, weightlifting, track and field, mountain climbing and spending time with his family.

He is survived by his wife Karen of Modesto; and three children, sons, Brian of Washington and Alan of Arizona; one daughter, Betsy Foote of Livermore; and seven grandchildren.

A memorial service will be held Sept. 14 from 2-4 p.m. at Downey Community Park, 1200 Brighton Ave., Modesto.

A scholarship has been set up at Modesto Junior College. Contributions can be made to the MJC Foundation c/o Richard Hickman Scholarship Fund, 435 College Ave, Modesto, CA 95350.

Newsline

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AROUND THE LAB



'Du Jour' serves up daily dose of humor in memory of artist's mom

By Leslie Schwartz

NEWSLINE STAFF WRITER

If you ask Robert Seymour, mobile computing architect and founder of the Lab's Handheld Working Group, what his latest project is, you might expect to hear a long description of his work on mobile computing, the portal development team or his improvements to the Institutional Web Resource Center online.

Drawing cartoons isn't the expected response. But that's what Seymour loves, and after more than 15 years of doodling for fun, he is now honoring his late mother's last request with his artwork.

Seymour began drawing as a young child. Coming from a family of mechanical engineers, he was torn between the path laid before him in engineering and his passion and talent for art.

The drawing pen was mightier.

Attending Kent State in Ohio, Seymour earned a bachelor's degree in fine arts in commercial art and continued to enjoy his chosen vocation. But when the job market fell into a slump, he noticed that many opportunities in computers were available. He went back to school to develop his computer skills when he moved to California 16 years ago with his wife Barbara, and two children, Marilyn and Andrew.

After the move, Seymour kept in very close contact with his mother in Ohio, who he consid-

ered to “not only be my mom but my best bud.” He wrote her weekly letters describing his life and doodled four humorous cartoons based on the chosen “topic of the day” in the corners of his letters.

The title of his cartoon, “Du Jour,” which means “of the day” in French, evolved from this custom.

“I drew the cartoons to lighten up my letters and to just have fun with them,” he said.

The main character in “Du Jour” is Harold, who is constantly getting in trouble with his wife.

work.

"I don't know where this is going to go," he admits. "I'm just going to play it by ear, evaluate people's responses and reactions, and continue to try and make people laugh. We'll just wait and see what happens and in the meantime I'll have some fun."

To view the Lab's own emerging cartoonist's work visit the "Du Jour" Website at <http://dujour.ws/els.html>, honoring the memory of Esther L. Seymour.

Lab seismologists stress earthquake shaking increases with magnitude

By Anne M. Stark

NEWSLINE STAFF WRITER

Nearly everyone knows that when an earthquake occurs there is shaking. But depending on the seismologist you're talking to, there are two different trains of thought on how much shaking will occur when "the big one" strikes.

As part of a one-year 2003 Laboratory Directed Research and Development project, two seismologists in the Energy and Environment Directorate are trying to clear up the mystery by determining the amount of energy released during an earthquake.

LLNL's Bill Walter and Kevin Mayeda recently coordinated an international workshop to discuss whether the density of seismic energy increases or remains constant as the earthquake fault length increases.

There are two ways seismologists measure earthquake size. The static measure called “moment” takes account of the total fault area and the amount of slip on the fault. This is sometimes reported as the moment magnitude and can be measured very accurately. The dynamic measure is defined as the energy radiated by the seismic waves and is more difficult to measure accurately. The ratio of the dynamic energy to static moment is called the “apparent stress.”

Of the attendees at the workshop, about half believed the apparent stress stays the same for earthquakes of all magnitudes. The other half believed the apparent stress, which determines the relative amount of shaking, increases as the earthquake magnitude goes up.

As principal investigator on the LDRD project delving into this, Walter said basic physics comes into play.

“Both thoughts can’t be correct,” he said. “There are implications for earthquake physics. Resolving this issue helps our basic understanding of how earth-

quakes occur.”

Using observational earthquake data from seismic stations in the Western United States and the Middle East, Walter and Mayeda have determined that the apparent stress on a fault and the amount of shaking during an earthquake increase as the size of the earthquake increases.

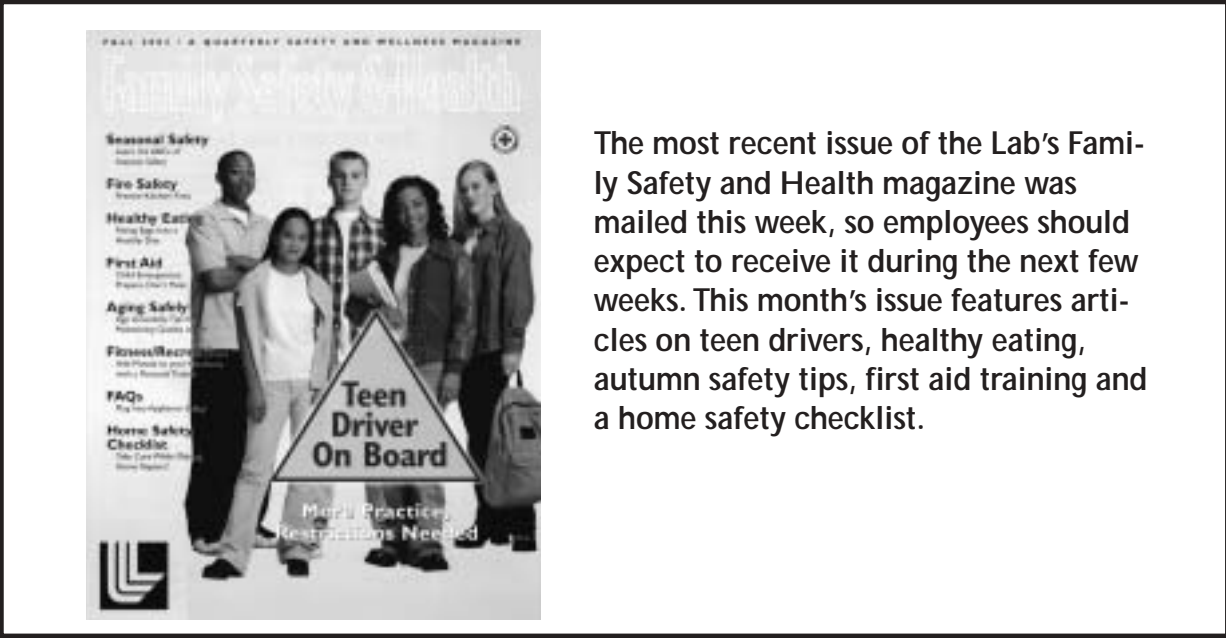
Using some of the same techniques and resources developed by the Ground-based Nuclear Explosion Monitoring (GNEM) Research and Engineering Program, Walter and Mayeda applied their seismic coda and regional wave modeling techniques to show that energy scaling with seismic moment is a real phenomenon of earthquakes.

“We’re using the techniques developed for explosion monitoring for fundamental science and applied

research,” Mayeda said. “It’s important to determine how earthquakes function from a hazard and public awareness standpoint as well as just being an important scientific achievement.”

Seismologists often use the occurrence of smaller events to help plan and predict what will happen when rare large destructive earthquakes occur. For example, a seismologist could take a small earthquake located at the expected site of a future large event and scale up the seismic waves. To do this accurately, however, requires the right scaling relationship.

Walter and Mayeda plan to publish their results in a peer-reviewed journal and make a presentation of their results at the December 2003 American Geophysical Union meeting and a planned Chapman Conference in 2004.





NEWS YOU CAN USE

BRIEFLY

Spanish classes return

The Amigos Unidos Hispanic Activities Group will again offer weekly conversational Spanish classes at the Lab. A continuously growing number of employees interested in learning Spanish has boosted the class roster to over 50 active students. Fall classes are currently scheduled to begin the week of September 8, 2003.

Ongoing classes are held Monday through Wednesday, while new beginners classes are tentatively scheduled to meet on Thursday. Each one-hour class meets once per week, between the hours of 12:00 and 2:00. All classes are held in Building 415, Room 239. Building 415 is accessible to family members by special arrangement and has ample parking.

The goal of the classes is to learn conversational Spanish while promoting an understanding of cultural diversity. The curriculum and pace of learning is tailored to meet the needs of each class. The instructor for these classes is Amparo Korbel. Amparo, a native of Colombia, South America, has been teaching Spanish classes for the Amigos Unidos for over ten years. For the past several years, Amparo has arranged professionally guided tours for class members to Spain, Costa Rica, and other Spanish-speaking countries.

The cost of the class is \$60, which pays for 12 to 16 weeks, depending on the number of students enrolled. Textbooks may be purchased at additional cost, although a few textbooks sometimes may be borrowed on a first-come, first-served basis.

To sign up or just learn more about the classes, come to a get-acquainted session in Bldg. 415, Room 239 on Thursday, August 21 at 12 noon. You can also call Ken Marsh at 2-2488 for more information.

Week of Caring coming soon

For the eleventh consecutive year, members of the Lab's HOME (Helping Others More Effectively) campaign are organizing a "Week of Caring," to recruit volunteers for community events assisting senior citizens and families in crisis.

These projects provide hands-on help to community agencies serving seniors, youth, the homeless, and the disabled. The Week of Caring signals an unofficial start to the HOME Campaign and provides a way to gear up for HOME activities.

In conjunction with the United Way of the Bay Area and the Volunteer Center of Alameda County, the Laboratory's Week of Caring runs September 15–20. Laboratory-supported projects have been scheduled in September, October, and November. On Saturday, Sept. 20, volunteers will help with two projects—organizing and cleaning the Buenas Vidas Thrift Store, and performing building maintenance at the Buenas Vidas Youth Ranch. Both facilities are in Livermore.

On Saturday Oct. 11, yard-work volunteers are needed at the Anthropol Counseling Center in Livermore. Additionally, on Friday, Nov. 14, volunteers are needed for setup, serving, and cleanup at the Pleasanton Senior Center during their Friday night dance.

All of these events provide much-needed help to agencies that assist local communities. After participating, volunteers will be able to see the positive outcome of their efforts.

For more information about the Laboratory's "Week of Caring," or to volunteer for any of these events, contact Polly Malik malik1@llnl.gov or Bridget Petrovic petrovic1@llnl.gov.

Quarterly blood drive

The Lab's quarterly blood drive will be held in Trailer 4181 on Sept. 8–11. Schedule an appointment in advance by going to the Website (<http://llesa.llnl.gov/>) and click on "blood drive" on the left side of the window. You can also schedule an appointment by calling 1-800-448-3543; use the sponsor code LLNL. Donor eligibility questions may be directed to the American Red Cross at 1-800-448-3543.

New badge office Website now available

The Badge Office Group has a new, revised Website (<http://www-r.llnl.gov/securityprogram/badges/index.html>) available. The new site features step-by-step instructions on requesting badges, processing administrative escorts, and becoming an area access requester, as well as new interactive forms and a listing of the many other services that the Badge Office provides. If you have any comments or questions about the content of the site, contact Debbie Cameron (cameron7@llnl.gov), 3-9952.

Technical Meeting Calendar

Tuesday
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CHEMISTRY & MATERIALS SCIENCE

"Two-dimensional Mass Spectrometry of Biomolecules" by Evan R. Williams, Chemistry

Department, UC Berkeley. 3:30 p.m., Bldg. 155 auditorium (room 1090) To obtain an abstract of his talk, see Website: http://www-cms.llnl.gov/cms_frontiers_ext/index.html. Contact: Mike Fluss, 3-6665, fluss1@llnl.gov, or Kristine Ramirez, 3-4681, ramirez24@llnl.gov.

RADIATION DETECTION CENTER

"What Can a 60 keV Neutron Beam Do?" by Wolfgang Stoeffl. 11 a.m., Bldg. 151, room 1207 (uncleared area). Contact: Ron Wurtz, 3-8504, or Christie Shannon, 3-6683.

Wednesday
27

DEFENSE & NUCLEAR TECHNOLOGIES DIRECTORATE COLLOQUIUM

Roundtable Discussion of the Recent Stockpile Stewardship

Conference in Omaha by Michael Anastasio, Bruce Goodwin, Larry Ferderber, Bret Knapp, Ron Lehman, Charlie McMillan and Hank O'Brien. 10 a.m., location to be announced. Clearance required, SP access, no foreign nationals. Contact: Mark Herrmann, 2-6999,

or Frankie Springer, 3-6192. For one-time SP access contact Springer.

Thursday
28

CHEMISTRY & MATERIALS SCIENCE — BROWN BAG SEMINAR

"Micro-Mixers for Studies of Protein Folding," by Olgica Bakajin and

"Investigating the Delta/Alpha-Prime Martensitic Phase Transformation in Pu-Ga Alloys," by Kerri J.M. Blobaum. 12 p.m., Bldg. 235, Gold Room (room 1090). Contact: Andrea Hodge, 4-3715, or Linda Jones, 3-8839.

Friday
29

CHEMISTRY & MATERIAL SCIENCE — MATERIALS SCIENCE AND TECHNOLOGY DIVISION

"Nanometer-Scale Analysis of Grain Boundary Segregation in Metals and

Alloys," by David B. Williams, Lehigh University. 3:30 p.m., Bldg. 235, Gold Room. Coffee and cookies will be served at 3:20 p.m. Contact: Tom Felter, 2-8012, or Rebecca Browning, 2-5500.

September
16

ILSA SEMINAR

"Electron Acceleration by Langmuir Wave-Breaking in Local Ion Density Gradients," by Nathan John Sircombe, University of Warwick, United Kingdom. 3 p.m., Bldg. 219, room 163. Con-

tact: Richard Town, 2-5389, or Josie Morgado, 3-4188.

September
17

CHEMISTRY & MATERIAL SCIENCE

"Phonon Dispersion Studies by Inelastic X-ray Scattering," by Michael H. Krisch, European

Synchrotron Radiation Facility, France. 10:30 a.m., Bldg. 235, Gold Room. Contact: Joe Wong, 3-6385, or Rebecca Browning, 2-5500.

September
23

RADIATION DETECTION CENTER

"Biomedical Imaging with Combined X-ray Transmission and Radionuclide Emission

Detection Techniques," by Bruce Hasegawa, UCSF Physics Research Lab. 11 a.m., Bldg. 151, room 1207 (uncleared area). Contact: Ron Wurtz, 3-8504, or Christie Shannon, 3-6683.

The deadline for the next Technical Meeting Calendar is noon, Wednesday.

Send your input to tmc-submit@llnl.gov. For information on electronic mail or the newsgroup llnl.meeting, contact the registrar at registrar@llnl.gov.

NEWS OF NOTE



Web resource for unclassified controlled information

Laboratory employees now have access to a user-oriented Website with straight-forward instructions on how to handle unclassified controlled information (UCI).

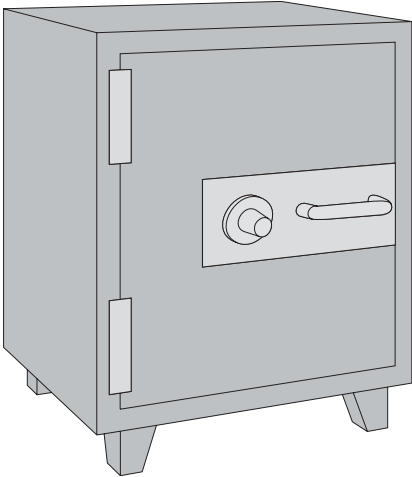
The new UCI Website [<http://www-r.llnl.gov/securityprogram/uci/uci.html>] gathers all of the applicable unclassified information controls from the Department of Energy and other federal agency orders in one place. In addition to helping users with the identification of the UCI categories that could apply to their document, the site includes the requirements associated with UCI protection, providing details on access control, marking, storage, transmittal and destruction.

“The site describes proper handling for seven categories of UCI with which we work, here and at LANL,” reports Dave Brown, head of the LLNL Office of Classification and Export Control. Brown notes that the site has attempted to capture all of the information that previously existed in various places, plus some of the recent modifications to the Official Use Only (OUO) guidance introduced last year.

Of particular note is the fact that DOE’s new OUO category now covers many types of traditionally controlled information that had special labels such as “CRADA-Protected,” “In Strict Confidence” and “Business-Protected.”

The Website resulted from a collaboration

between LLNL and LANL led by the University of California. LANL is unveiling a parallel Website with the same information, including some very small exceptions based on differences between the labs.



The University is striving to achieve the right balance between free exchange of ideas outside the labs and appropriately controlling sensitive information. This means giving the employees who create ideas clear, consistent directions on how to do so.

Unfortunately, both LLNL and LANL have struggled to provide up-to-date, clear, easy-to-find requirements for

protecting unclassified but sensitive information. As far back as 2001, DOE, Congress and Integrated Safeguards and Security Management (ISSM) focus groups and workshops at both labs requested help handling what they called then sensitive unclassified information (SUI) or sensitive unclassified technical information (SUTI).

Furthermore, within the DOE complex, UCI handling requirements among sites are not uniform. UC’s objective was to provide consistency at least between both of the national security labs it manages. Other DOE labs have expressed interest in the UCI project and may ultimately

adopt the Lab’s procedures.

In addition to providing much-needed assistance, the UCI Website focuses on what its users need to know to work securely. Rather than point users to the Classification Office for identifying categories of information, the Classified Document Project Office for protection (e.g., marking and destruction), and Cyber Security for electronic transmission, all of these elements fit seamlessly in one Website.

“I’m hoping this is how we do security-oriented Websites from now on,” said Jason Carpenter, who manages the UCI Website and many elements of the Safeguards and Security Program Web presence as well. “This is how ISSM is supposed to work. People don’t care about which organization provides the help; they just want to get the info they need to work securely and get back to work.”

Carpenter said that even though the site was first posted in late July with a quiet announcement, he already has received a good deal of feedback.

“People are happy that this information is finally available in a clear way,” he said. “Of course, we’re going to keep improving the site. We want every single user, regardless of browser or platform, to be able to read, print and copy the info they need to get out of it.”

Employees are encouraged to visit the site. Anyone who has questions about the content should contact Brown, 3-3194 or brown10@llnl.gov. Comments about the performance or appearance of the web site should go to Carpenter, 2-3678 or carpenter13@llnl.gov.

Security escort program allows retirees to keep Lab ties and clearance

By Leslie Schwartz
NEWSLINE STAFF WRITER



While most employees dream of retirement, many want to retain close ties to the work community they have been a part of for much of their careers. The Lab’s security escort program does just that.

The program provides an opportunity for retired Department of Energy L and Q-cleared employees to work part time as a security escort at the Lab in order to retain their clearance and earn money, while giving back to the Laboratory. The 55 escorts currently employed by the Lab work an average of two days or 16 hours a week and earn an hourly salary and pro-rated benefits.

Escorts are responsible for monitoring guests and contract workers who need to visit or do business in classified areas at the Lab. Each security escort is responsible for up to seven guests while inside a building.

“It’s a great no-pressure position,” said Bruno Blasigh, the security administrator for the program. “The escorts come because they want to be here and can visit old friends, and they have the freedom to choose when they want to work,” he said, outlining some key benefits of the security escort program.

In addition to being knowledgeable about LLNL missions, Lab retirees also are familiar with safety and security procedures and must complete a weeklong training course before becoming escorts. Two days are spent watching safety and security instructional videos and reading the policies and procedures during the in-

house training, and the following three days consist of on-the-job training where prospective escorts shadow veteran escorts in the field to see how the job is done.

Ernie Hodges has been an escort for more than 20 years and feels that the program is “excellent. I have the best bosses and work with the best people in the world.” Hodges, who went into security through the government in the 1940s and later

served in the army, became an escort in 1979 in order to do what he loves.

If you are thinking of retiring or working part-time, consider the security escort program. With reasonable hours and many benefits, this program facilitates visits to the Lab by uncleared researchers and other guests. To apply or for additional information, contact Blasigh, 2-7018 or pager 04740.

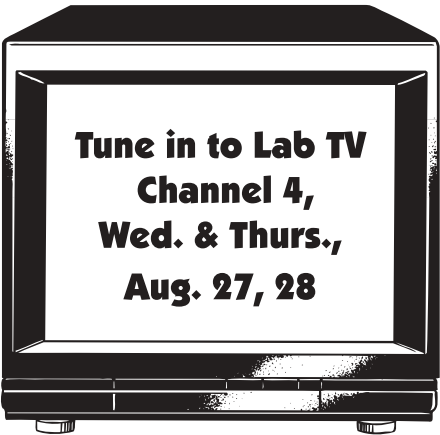
Two videos explain how to prevent ergonomic injuries

How to Set Up Your Computer Workstation

Produced by UCLA; approx. 10 minutes.

Demonstrates how to adjust screen to reduce glare and neck strain, set up your keyboard to prevent wrist problems, adjust your chair properly, and more.

Shown on the hour at 10 a.m., Noon, 2, 4 and 8 p.m., and 4 a.m.



Back at Home

From Hazards Control video library; 21 min.

Helps you understand how lower back pain prevention is a 24-hour a day, seven-day a week job. The benefits of good lifting and other ergonomic skills practiced on the job can evaporate if you do not continue applying the same basic principles off the job. The basic principles of good lifting technique are demonstrated.

Shown on the quarter hour at 10:15 a.m., 12:15, 2:15, 4:15 and 8:15 p.m., and 4:15 a.m.

Many other videos on ergonomics and other safety topics are available for loan from the Hazards Control Video Library. To learn what is available, go to <http://www-hctrain.llnl.gov> then select “video library” (4th selection on left side menu).



AUTOMOBILES

2002 - Chev Suburban 2500 4x4. Many extras. Low miles. Modified fuel sys. good gas mileage. Extended Warranty. Ex. condition! \$28,500 OBO. 209-599-7047

1995 - Oldsmobile 88 LSS, white exterior, leather interior, AM/FM/cassette/CD, ABS(4-wheel), pwr locks/windows/front seats, air bags, 87K miles, \$3000 OBO. 925-454-1516

1997 - Ford Expedition Eddie Bauer,154K miles but in great shape. Multi CD, moonroof, leather, towing pkg, bed liner (no 3rd seat). \$8,500 (Bluebook \$10K). 925-449-4243

1993 - Ford Explorer Limited 4WD, Very Good Condition; Leather, all power, CD Player, roof rack Green/Grey Almost new tires. 130K miles. \$4,500.00 OBO 925-447-5002

2000 - Honda Accord LX, Silver with Grey leather Only 35K miles, CD Player, all power, Excellent Condition \$13,250 925-447-5002

1996 - Toyota Camry LEV6, excel cond., 49,800 miles, A/T, A/C, orig owner, \$8100 925-846-1838

1986 - VW GTI, 5sp man. 175Kmi, good cond., ps, sunrf, new transm, new axles, new brakecyl., runs great, very clean, \$1600, 510-665-5920

1995 - FORD Escort LX 4D, auto, 92k, runs great, pwr steering/doors/windows, AM/FM radio, Cassette, A/C needs work. Must sell. \$2500 OBO. 925-600-8312

1963 - Studebaker Avanti R1. Auto AC PS PB PW. Runs well, daily driver that wants more attention than I can give it now. \$7500. 925-447-0596

1997 - Eldorado,excellent condition. Bose system, security system, new tires, low miles, always parked in garage. A buy at 13,900.00. Must see. 510-582-2938

1972 - Ford Maverick Limited Edition with all factory options, mint restoration,like new. Pearl white. \$11,995 925-447-6670

1968 - firebird 350hp munci 4spdtrans \$11K Joe Calderon 510-760-4447/916-837-6665/209-522-1942

1986 - Toyota Cressida 120,000 miles, one owner, automatic, power steering, windows, locks, cruise control, AC needs work, \$1500 or best offer 925-447-4945

2002 - Mini Cooper-S fully loaded & sun roof; 11K miles; \$23,000; contact Betty. 510-593-1049

1995 - Miata, dark blue/green, 5-sp, new top, glass rear window, CD player, cruise cntrl, pwr windows, pwr mirrors, air, 80K miles, \$5500 925-831-9087

2000 - NISSAN MAXIMA SE - White, Leather, Beaut. Cond., Loaded: LOW 27k mi,A/T,TCS,A/C,ABS,CC,Power All, Bose Sound, F/S Airbags, Sunrf. \$17,900 OBO 925-518-9848

1969 - Mustang convertible,302 V-8,3speed manual on floor,aqua ext./white deluxe interior \$6500.00 925-373-0483

1992 - Ford Escort LX, 4dr, auto, ac, cc, cd, 48k miles. \$2,300 OBO. 925-455-8238

1997 - Chevy Monte Carlo, 90K, exel. shape, detailed maint history, good tires. \$4k-obo 925-352-4248

CLASSIFIED ADS

1999 - Shasta M-275 WB, V-10 engine, upgraded upholstery, air assisted ride, 4KW generator, many other accessories, ex/cond, asking \$24,995. 925-513-8357

2000 - Volkswagon Jetta GLS VR6 Automatic. 36K miles. Black with tan leather interior. Very clean. \$15,000 firm. 925-516-8810

1991 - Honda Civic LX sedan, AT/PW/PL/AC/CC, good condition, \$2,500 obo, 925-275-1417

1993 - Jeep Wrangler, soft top, 76K miles, \$4,500, 510-481-2281.

AUTOMOBILE ACCESSORIES

1999 - Camper Shell-black/felt lined Innovations for Toyota SR5/Tacoma-Good Shape-\$250.00 OBO 4-6795 925-443-6659

Sears Craftsman power wax & buffer for autos,boats,or RVs. Excellent cond. \$50 obo. 925-249-1640

Acura Integra custom car cover with mirror pockets. Lock and storage bag included. Fits 1994 or newer 2-door coupe. \$60.00 925-447-4352

Weight distributing trailer hitch, Reese, used once \$100 925-829-3175

Thule roof rack. Excellent condition, barely used. Fits most standard cars. \$100. 510-351-0969

BICYCLES

20 inch girls bicycle. Mountain bike type. Five speed. Very good running condition. Has a few scratches. \$50.00 935-447-4657

Specialized 2002 Enduro Pro, Disc Brakes, Front & Rear Shocks, Speedometer, Shamano Derailing System, \$1000.00 OBO. 209-836-1449

Tag Along child's tandem bike. Attaches to adults bike. Like new. \$95. 925-455-5816

Diamond Back 20 inch mountain bike, 18 speed. Great shape, little used. Ideal for 7 to 12 year old child. \$50 or offer. 925-606-6515

1996 Cannondale F500 w/OCLV Carbon Fiber Bar Ends & two water bottle cages. 415-269-9491

BOATS

14 ft. Alumacraft boat w/wide beams w/trlr, 5 gal gas T, Honda 10HP 4 st mtr, trol mtr, new batt, depth finder,life jkts, more. Call for price 209-576-0217

1989 Yamaha Waverunner WR 500 with trailer. \$750 or trade for dirt bike. 209-334-1006

Columbia 23 sailboat on trailer. Excellent condition. \$2000.00. Ask for Dan 209-239-1173

Jet Ski-1996 Kawasaki 1100,with trailer and cover. Chrome rims on trailer. \$4200 209-833-8777

CAMERAS

Brand New JVC video camcorder never used. Paid 850 Will sacrifice 600 925-580-2814

ELECTRONIC EQUIPMENT

Laptop - PII 266Mz. Floppy, CD-rom, modem, bag. Win98SE with office suite. Works great, Battery charge is weak. \$150. Contact Alex 925-784-3731

Pioneer Elite (top-of-the-line) 60inch projection TV. Black lacquer finish. Beautiful and great picture. Orig. \$5600, sacrifice for \$1500. 925-361-7111

IMAC w/G3, 9 gig HD, 100 mg Zip, MS Office, Norton, Print Explosion, plus much more, \$350 OBO 209-892-3727

JVC VCR Hi-Fi, Sherwood Surround Sound Amp, Sylvania 19in. TV, Magnavox CD Player, Oak-Look TV/Stand. Everything works. U-Pick up. \$150/Best Offer 925-277-1704

Dell Desktop PIII 600MHZ 384mb Ram 2 20gb Hard Drives, 10/100 NIC CD-RW and DVD w/17in Mitsubishi Flat screen CRT. Tracy \$350.00 209-830-6380

Computer, Macintosh IICi, 14 inch monitor, exterior hard drive, CD Rom, \$25 925-829-3175

View Sonic -Professional Series P810 21 inch Color Monitor \$125.00 925-454-0510

Cerwin-Vega Center Speaker LS-6C for home surround sound system. Excellent sound, perfect condition. \$100.00 925-625-7972

GIVEAWAY

Leaded glass chandelier. Brass and clear glass. Makes rainbows - very pretty. In Livermore. 925-454-1608

Cultured marble bathroom countertop with 2 built-in sinks, single piece. 67 in x 22 in. You pick up. 510-351-0969

HOUSEHOLD

Convertible Crib - 1 year old (pine finish) mattress & conversion kit incl. \$300.00. Changing table (pine finish)\$60.00. Porta-crib \$60.00. 925-240-8392

SEARS cartop medium size carrier. Excellant condition, just used once. Asking \$40.00. 925-846-4221

For Sale-Crib with mattress, high chair, double jogging stroller, bike trailer, battery-operated swing.Much more Make offer. 925-606-0133

GE (Black) profile build-in double Microwave/Thermal Oven. Brand new at \$1599, never opened. Perfect as a replacement. \$699, what a deal! 925-361-7111

Maytag heavy duty washer and dryer. Excellent condition. Almond. \$250. 925-736-4675

Kitchen table with 6 chairs. Good condition, white-washed stain. Versatile oval dimension, 2 leaf extensions. Call for pictures via email. \$200. 925-964-0534

Futons-one w/black frame, one w/light wood frame, full-size; mattresses included; sturdy, great condition; \$75.00 each 209-830-7978

Secretary, antique. Chippendale, mahogany. Excellent condition. \$1000. 925-447-0574

Antique Oak Dining Table. Excellent condition. Drawleaf, 35 X 60 plus two 12 in. leaves. \$250.00 925-449-5441

Victorian-style couch. Cream fabric; mahogany wood. Lovely piece of antique furniture. Very solid. \$200 925-447-8820

New Amana White Refrig. Need to sell. Bargain at 400.00. Paid 650.00 510-537-7222

Little Tikes Playhouse - \$80. Little Tikes Red Car - \$10. Little Tikes Play Structure - \$20. Simmons

Maple Crib with mattress - \$150. 925-833-2560

Kenmore washer and Gas Dryer,White,Extra capacity 70 series,used only 6mos,mint cond. Beautiful set,pics on line 500.00 925-783-5607

Air cleaner, portable, Honeywell Enviracaire mod# 12500, used once, \$85 925-829-3175

Cal-King Sleigh Bed with mattress. Matching dresser included. Excellent condition. \$500. please call (215)435-0168

Carpets from Turkey, handmade, 100% wool, large room size carpets and small decorative kilims available. 925-784-7161

6.5 foot couch with hidabed. No stains or visible tears. \$20, you pick it up. 925-456-3418

Kitchen Table-Light oak w/4 chairs, excellent condition \$100 925-443-4848

MISCELLANEOUS

Casio CFX-9850G - color graphic calculator- \$25. For advanced math, science, and engineering. Like New. Contact Alex. 925-784-3731

Burton Snowboard, bindings, boots, bag. Excellent condition. \$200 obo. 925-249-1640

GE refrigerator/freezer, side by side. 22 cu.ft. \$200. Whirlpool washer, 18 mo. old, \$200. GE dryer, \$100. All working. 925-447-0574

Antique diningroom light. Very unique. A bargain at 15.00. Will bring to lab to show interested person. 510-537-7222

Garage Sale - Saturday 8/23 9 Del Oro Court, San Ramon (Twin Creeks) NO CLOTHES 9:00 AM - 3:00 PM 925-837-0863

Candy machines. Green & gold with wooden stands. Great income opportunity! Call for more info. Will sell separate or as package. 209-334-1006

Moving sale: 1033 Aspen Way in Manteca.Baby-adult clothes,various household items,car parts,furniture. August 23 8:00am till ? 209-823-8237

Copier, Office, Lanier 6360, 8.5x11, 8.5x14, 11x14, collates 20 copies a run, you transport \$400.00 925-829-3175

Clear Plan Easy Fertility Monitor in excellent condition \$100. 209-234-2314

AC window unit 220v \$75, light oak end table \$35, misc. framed pictures b.o. 925-443-4848

MOTORCYCLES

2001 - Yamaha R-1, like new, low mileage, \$7,990. 530-343-0333

1980 - honda motorcycle cx400 \$800.00 call bob 925-294-9123

MUSIC INSTRUMENTS

Premier drums,burgundy lacquer,rack,many extras \$1000 1983 Fender Stratocaster, USA black extras. \$450 925-373-0483

Hi Fi Speakers: Pioneer 12inch 4-way, \$200/pair, Mitsubishi 10 inch 3-way, \$150. AR Subwoofer, \$95 All excellent and worth much more. 925-361-7111

Flute: Bundy II, Silver plated. Perfect for beginning student. \$220 209-609-0603

PETS & SUPPLIES

Crested Gecko For Sale - All included; Tank, supplements. Total \$60. Also for sale: Two large lizard cages, \$30 each. Contact Alex. 925-784-3731

Bonnie the cat needs a home. 7 year old, very affectionate, domestic shorthair. Spayed, all shots. Please help. 510-832-3113

Baby Cockatiels for sale. Lutinos-\$50.00 each. Call after 6:00 PM and ask for Chris. 925-606-7128

Loving playful young dog needs a good home. She is a stray and she is deaf, but it will not take you long to love her. 209-545-8871

180gal reef tank with EVERYTHING. (Incl fish, corals, live rock, chiller, canopy/stand, 440w lighting, Ecosystem sump. Cost over \$8k new, asking \$3k 925-240-9075

Child/youth western and english saddles. Blue Ribbon Custom Tack, Circle Y, Collegiate, Keystone. Also western hats and show clothes. 925-462-9455

Great Cat! - Needs a Home! Travels well/great in a car. Gray & white - 3 yr old? playful, friendly & healthy 925-210-1163

RECREATION EQUIPMENT

Windsurfing Gear: Carbon fiber mast, 3 sails, boom, mast base, harness, fin. Great cond. \$300 obo. 925-249-1640

Weight sets with benches. 300 lbs set for \$150 obo and one approx. 200 lbs \$50 obo. 925-373-7328

Slide. 10-foot plastic like those used in play structures. Great condition. \$75. 925-455-5816

Pair of PRE snow skis with poles \$50 209-234-2314

1977 24ft Winnabago Motor home,AC, Central Heating, Kitchen & Refrigerator,Shower & Toilet. TV,Sleeps 6 Excellent Condition. \$5500.00 obo. 925-516-9678

1999 Shasta M-275 WB, V-10 engine, upgraded upholstery, air assisted ride, 4KW generator, many other accessories, ex/cond, asking \$24,995. 925-513-8357

RIDESHARING

Express your commute, call 2-RIDE for more information or visit <http://www-r.llnl.gov/tsmp>.

Turlock - Anyone in the surrounding Turlock area interested in forming a vanpool? Send me an email at speckens1@llnl.gov. 209-535-4062, ext. 3-0347

Lafayette - LaMORinda Vanpool (also Walnut Creek stop at Rudgear Rd): reclining seats, reading lights, 7:45-4:45, \$105/mo (pretax reduction available) 925-943-6701, ext. 2-3005

SHARED HOUSING

Livermore - Room for rent w/kitchen, laundry privileges. Near golf course, pool. \$550 incl util. No deposit. Must love dogs. 925-243-9316

SERVICES

Need A TUTOR- SRVUSD teacher on child care leave looking for 3rd thru 6th grade students. Tutoring at

our home only, located in Danville. \$50/hr. 925-964-0534

CHILDCARE ñ Manteca Teacher/Child Dev.Major looking to fill 1 opening for ~2 yr old boy. Now caring for 2 - 21mo old boys. Call for rates. 209-824-1044

House Clean- Tracy, Livermore, and Modesto area. Please call Annette at 209-529-1404 or 925-443-3600

Inflatable Jump Tent rentals. Half day or all day, reasonable rates, great for parties and special events. Call 1- 866-DAY-JUMP

In-home childcare for 2 1/2 year old, Livermore. 8-12 hours per week. Must have own transportation. Toddler CPR certified. 925-373-7730

CONCRETE - custom, stamped, colored, foundations, restoration, sealing, etc. Over 20 years of experience. Free estimates. Lic.# 787092-B 408-806-9816

REPLACEMENT WINDOWS at

reasonable prices. Also; doors, interior trim and crown moulding. Dave Lic#433442 925-443-8587

HouseCleaning Service Tracy and Livermore area good references and experience 209-833-6467

Construction/consultation/inspection services. 209-836-3062

Promotional photography and portraiture for music artists, actors, entertainers. Livermore studio or location. lafterhalldotcom. 925-449-0107

Piano Tuning—your place or mine. 10% LLNL discount on regular tuning. Mike Brosius 925-371-6997

Affordable personal training from an experienced and trained professional. Tiffany Wissman, In Medesto 209-613-8970

WELDING Services-Steel Only. Need something designed/built, repaired/changed? i.e. Trailers, Towing Hitches, odds/ends. 925-200-3188 or 925-829-5126

Child Care Available: Newborns and older OK. Located right next to LLNL! License: 013416736. First come/first served. 925-245-9521

TRUCKS & TRAILERS

1985 - 22ft Winnebago Motorhome 42k miles, Generator,new tires,ac, original owner always covered very nice condition 14k. 209-914-4085

1993 - F250, 460, 5 Speed, Ext Cab, Longbed, 4x4, CC, PW, PWDL, AC, Low Miles, Clean, 13,500 OBO 209-892-6720

1991 - GMC P/U-dropped 4&6 - Boyds wheels - \$1.5K stereo - lo miles - meticulously maintained by one owner since new - too much to list - \$7500 OBO 925-449-0982

2002 - Roadmaster RM440 tow dolly w/ electric brakes. \$1200 209-836-4605

2002 - Dodge Ram 2500 Quad

Cab 4x4, White,Diesel, long bed, bed liner: Excellent condition: buy out or take over lease payments. 209-552-0467

1999 - COACHMEN LEP-RECHAUN, 26 1/2 ft,Class C, Tritan V10, Lg Slideout, TV/VCR, CD Player, Lg Rear Bathroom,Awning,Exc.Condition. Only 18,900 miles. 925-443-3355

1993 - S-10 Blazer, Tahoe model 4 dr 4x4. 4.3 liter, V6, Automatic. PW, PL, PB, AC, Tilt, Cruise. 93,000 miles \$5,500 obo. 925-516-4402

1999 - Car Tow Trailer, asking \$550.00 925-513-8357

VACATION RENTALS

Truckee - Tahoe-Donner Ski Cabin group has openings for new members. Unlimited use. Thanksgiving - April 30. \$550 + 50 deposit. Call for details. 925-447-0596

SOUTH LAKE TAHOE - 3 Bed-room 2 bath Chalet, nicely fur-

nished, All amenities, Park w/ Lake, tennis etc. Great for family vacation! RESERVE NOW FOR SUMMER OPENINGS! 209-599-4644

SONOMA COAST - - Oceanview home. No smoking. No pets. Adults only. 2BR(KQ)/2BA 1700sqft. Hike. Bike. Whale watch. Kayak. Swim. Tide pool. http://come.to/searanch 925-443-5086

WANTED

Bike rack for hatchback 925-443-4413

49ers vs Tampa Bay Tixs 209-649-3750

Wanted: 49er tickets mult games 209-649-3750

Services and merchandise listed in *Newsline* are not guaranteed. It is up to the buyer to scrutinize services purchased.

CHILD CARE

Continued from page 1

process, which was an intense, voluntary self-study, coupled with an external professional review. “This was a good chance for us to look closely at our program and make improvements where needed. And, the attempt to gain accreditation was highly supported by staff and parents.”

Providing year-round child development services for infants, toddlers, preschool and elementary school age children, the Children’s Center is managed by LLESA with input from the Center’s Parent Advisory Council (PAC). The PAC consists of parent volunteers who meet monthly to work with staff on such agenda items as revenue enhancement projects, social events, and annual budget recommendations.

Key people — particularly Lab employees with children — set the cornerstone for the center when it opened its doors back in September 1986

to serve the children of Livermore Lab, Sandia, DOE, and LLNL contract employees. Currently, there are 180 children enrolled and 37 staff working at the center.

The Children’s Center strives to meet the needs of the families it serves, offering a schedule that matches business hours and holiday leave time to that of the Laboratory. When the Lab is open, the Children’s Center is open, to accommodate working parents.

Several factors are responsible for the center’s success, Reno believes: a low teacher-to-child ratio; trained and qualified staff; and a “hands-on learning” philosophy.

Ellen Raber, head of the Lab’s Environmental Protection Department views the program at the Children’s Center as outstanding. “My daughter, Alison, started in the infant room and was at the Children’s Center through Preschool 2. She then went on to Valley Montessori school, where she is currently entering 5th grade. She has continued to come back every summer for camp and loves to visit with her life-long friends. I wish a new sum-

mer program could be structured for middle schoolers—we would be first on the list, ” Raber said.

Although Lab-based, the Children’s Center is community supported and operates from the same Almond Avenue School location where it first began. “It takes a community to operate a Children’s Center,” Reno added, implying that a variety of people are responsible for making it happen — teachers and staff, Lab employees, parents, and the community. “The Livermore School District and the City of Livermore have been very supportive and helpful, especially with regards to our physical facility and traffic concerns.”

In addition, Las Positas College in Livermore has been instrumental in providing student teachers that major in early childhood education to intern, while learning their craft.

As the Laboratory shifts from an older to a younger work force, the availability of an accredited and high-quality Children’s Center close to the Lab’s main site will no doubt serve as a valuable recruiting tool.

BIOSCIENCE

Continued from page 1

the forefront of biomedical and environmental research for four decades.

The document begins with an account by the biomedical research program’s second director, Mort Mendelsohn, of the extraordinary 50-year study to monitor the health and DNA of the Hiroshima and Nagasaki A-bomb survivors. It goes on to capture the personal reminiscences of 18 other scientists who have been intimately involved in the Lab’s bioscience programs and accomplishments. Some highlights:

- Joe Gray and Dan Pinkel trace the development of a process for “painting” individual chromosomes with fluorescent colors to help locate genetic abnormalities caused by ionizing radiation. The patented technique, called “fluorescence in situ hybridization” or FISH, substantially furthered the A-bomb survivor studies and has become one of the Lab’s most widely used and oft-cited technologies.

- Andy Wyrobek explains how FISH assays are used to detect abnormalities in human sperm caused by radiation, toxic chemicals, and chemotherapy. Recent research, Wyrobek says, shows that damaged sperm is sometimes, but not always, repaired when it mates with an egg. “We’re trying to understand the genetic basis of the differences,” he says.

- Christa Prange describes the development of IMAGE, a gene library that now holds the world’s largest public collection of genes. Thanks to IMAGE, says Prange, “researchers do not have to waste valuable resources trying to find a gene; they can just order it and spend their time studying what it does.”

- Jim Felton and Ken Turtletaub recount how, working with physicists at the Lab’s Center for Accelerator Mass Spectrometry, they discovered that cooking meat at high temperatures increases the presence of cancer-causing mutagens in the food. “The bottom-line finding of our research,” Felton says, “is eat the food you want but cook it in a safe manner.”

- Tony Carrano, BBRP’s third director, and Elbert Branscomb, founding director of the DOE Joint Genome Institute (JGI), contribute their perspectives on the Lab’s involvement in the Human Genome Project. Carrano recalls the project’s conception at a 1984 DOE conference in Alta, Utah, and the work that followed at Livermore, especially on Chromosome 19, that laid the groundwork for the project. Branscomb provides insights into the hotly debated agreement to consolidate the genome sequencing programs of Lawrence Livermore, Lawrence Berkeley, and Los Alamos labs into a consolidated, high-throughput sequencing center in 1997. “There is no doubt that launching (the JGI) represented a great, do-or-die gamble for DOE,” Branscomb says, (and) “there is little doubt that the success of the JGI saved DOE’s genome bacon.”

- Tom Slezak traces the development of the Lab’s bioinformatics program, which pioneered the use of whole genome analysis to determine the unique DNA “signatures” of pathogens. “Now it takes less than two hours to come up with likely signatures for a new pathogen” like the SARS virus, Slezak says.

- Fred Milanovich describes how the lab developed portable pathogen detectors that can quickly identify DNA using a technique called rapid PCR (polymerase chain reaction). The Lab’s detectors “are the type of advance that I believe

could only happen at a place like Livermore,” Milanovich says, “where biologists, engineers, laser physicists, and computer scientists work side by side.”

- Pat Fitch and Dennis Matthews review some of the Lab’s health-care technologies: using lasers to treat stroke patients; new biosensors and x-ray catheters; Peregrine, an advanced method for targeting tumors with radiation treatment; artificial retinas and kidneys; a new probe to detect breast cancer; and new techniques to detect the presence of genes or proteins which would indicate an actual or potential cancer. “Doctors came to us and essentially asked rocket scientists to develop medical devices,” Matthews says. “There’s a lot we can do for the health industry.”

- Rod Balhorn and Mike Colvin recount the rapid growth of the Lab’s structural and computational biology programs, including current projects to detect pathogenic bacteria and viruses, develop therapeutics to counter exposure to anthrax and other biotoxins, and design new cancer therapies.

- Bert Weinstein, acting associate director for BBRP, tells how the Lab put the “bio” in biodefense by successfully tackling the complex biological, technological and administrative challenges of pathogen detection. “Eventually, we learned how to formulate and articulate the science goals in a way that technologists, biologists, and program managers could all understand. . . .” he said. “We had the right people and we made the right partnerships.”

Included in the document is a large “timeline” poster tracing the key events in the Lab’s bioscience program. “40 Years of Discovery,” edited by Arnie Heller and designed by Amy Henke, is available by contacting Andrea Jenkins (jenkins14@llnl.gov).

Red-legged frog at home in Lab and Site 300 habitats

Editor's note: This column inaugurates a new monthly feature by Laboratory wildlife biologists about wildlife at the Lab and Site 300.

California red-legged frogs may be found in most wetland habitats at the Laboratory and Site 300.

The California red-legged frog (*Rana aurora draytonii*) historically ranged from Marin County inland to Shasta County and southward to North-west Baja California. Documented throughout 46 counties, the red-legged frog is now extinct in at least 24 of these, and as a result, received federal protection in 1996 as a "threatened species" under the Endangered Species Act.

Metamorphosis, an important milestone in its transformation from tadpole to frog, occurs in July and August. Egg masses (far left) of a few hundred to thousands eggs laid in February-March have spent the last several months developing through the risky tadpole period (second from left). The tadpole period is thought to be the stage of development in which the highest mortality occurs.

In July, metamorphosis (second from right) has begun; front and rear legs have formed and developed, and the tail, which has been so important for mobility over the last few aquatic months, is now being absorbed into the body. When the tail is completely absorbed the tadpole is considered a frog.



Article and photos by Michael G. van Hattem

As a native species, red-legged frogs have evolved and adapted to the Mediterranean climate of California, completing metamorphosis in early summer before wetlands dry out. To avoid the danger of drying out, red-legged frogs can disperse into upland habitats and seek refuge in California ground squirrel (*Spermophilus beecheyi*) burrows, riparian areas or other wetlands. Frogs have been documented moving up to two miles in just a few days.

The diet of the California red-legged frog is highly variable; as larvae, these frogs are thought to be algal grazers, and as they develop into frogs their diet shifts toward invertebrates and small vertebrates such as Pacific tree frogs (*Hyla regilla*) and California mice (*Peromyscus californicus*). Cali-

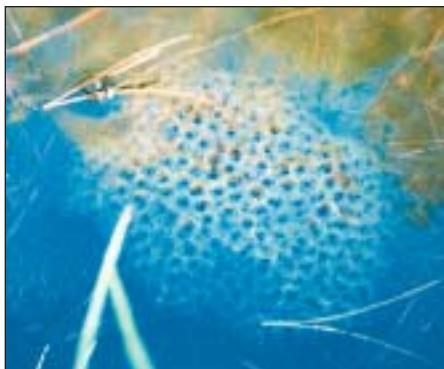
fornia red-legged frogs are California's largest native frog, attain sexual maturity at 2-3 years of age and may live 8-10 years, although the average life span is probably less.

A number of human influences threaten the survival of the California red-legged frog including loss of wetlands, use of pesticides and introduction of non-native species such as the bullfrog (*Rana catesbeiana*). Although threats to remaining populations vary geographically, introduced aquatic predators constitute the most significant threat to remaining populations within suitable habitat.

The U.S. Fish and Wildlife Service considers the Tri-Valley and surrounding foothills a "Key Area" for conservation because the California red-legged frogs can still be found in decent numbers compared with the rest of California.

Lab policy and federal law protect the California red-legged frog. You can help the California red-legged frog by avoiding impacts to wetland areas and not releasing any pets or other wildlife into ponds and streams. Contact the Environmental Protection Department's wildlife biologists if you encounter a frog at either of the sites.

For questions or additional information about this article, contact wildlife biologist Michael G. van Hattem at 4-6795.



Red-legged frog egg masses



Red-legged frog tadpole



Metamorphosis of tadpole to frog



Adult red-legged frog

PLUTONIUM

Continued from page 1

large single crystals necessary for inelastic neutron scattering.

Instead, Wong and his colleagues used an inelas-

tic X-ray scattering technique to impinge a micro-beam from a highly brilliant X-ray synchrotron source on a single grain in a polycrystalline plutonium alloy to make their measurements.

"The phonon dispersions are very fundamental to the understanding of the properties and

behavior of plutonium and its alloys," Wong said.

"The new phonon data will greatly enhance scientists' understanding of the transformations and phases plutonium undergoes in different environments and over time. Basic knowledge of this sort is much needed and contributes greatly to the Laboratory's science-based stockpile stewardship mission to ensure the safety and reliability of the nation's aging nuclear weapons without testing."

PATTERSON

Continued from page 1

served as the program leader for the Brilliant Pebbles Test Program.

In his first all-hands meeting with employees Monday, Patterson emphasized the directorate's track record as reason for doing little to change Engineering – at least initially. "This is certainly not an organization that needs somebody to come in and save it," he said. Instead Patterson will work to build the directorate around the set of Lab values in order to promote public trust.

"The Lab deserves and must work to receive absolute trust in what we do," he said. "This is not an option."

Patterson also wants his directorate to be a fun place to work, one that promotes new ideas and then fulfills them.

He admitted he was on a steep learning curve and warned he would "ask stupid questions. It's all right to laugh," he quipped. "At least for the first six weeks."

"Having a permanent AD gives a psychological boost to the Engineering organization," said Monya Lane, the deputy AD for Operations in the Engineering Directorate. "Steve's national reputation in precision engineering means that LLNL Engineering gains an important presence in the technical community. And his significant hands-on experience means that he will have credibility with Engineering employees. Equally

important is Steve's stated intention to uphold Engineering standards and values, which are the framework for accomplishments of Engineering personnel working throughout Laboratory programs."

Upon his return Patterson said one of the gratifying things he has witnessed is the fruition of things that were only ideas or in beginning stages when he left. Among them the National Ignition Facility, work in nonproliferation and the myriad diversity and mentoring programs.

Patterson said he would continue to push for diversity within his own directorate, adding that the word brings many meanings to him. Not only is it important to increase ethnic diversity, but Patterson is adamant about maintaining strength and depth in technical skill and capability.

"Our ultimate use is to strengthen the country," he said of the Lab. "There are very few places around the country where there is the same confluence of absolute world-class technology and unwavering public interest."

"I'm very happy to have him back as my boss," said Jeff Williams, who had been serving as acting AD. "He brings to the table a huge breadth of experience."

"From his background in physics and applied science to his work in materials fabrication in precision engineering to his theoretical work as a professor, he goes from tactical to practical," Williams said. "He will be a great role model of all engineers and an influence on all managers."



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